



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,445	09/20/2005	Jan Aberg	47253-00052USPX	8666
23932 7590 02/03/2010 JENKENS & GILCHRIST, PC 1445 ROSS AVENUE SUITE 3200 DALLAS, TX 75202				
EXAMINER				
KRETZMER, ERIKA A				
ART UNIT		PAPER NUMBER		
2192				
MAIL DATE		DELIVERY MODE		
02/03/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/522,445

Applicant(s)

ABERG ET AL.

Examiner

Erika Kretzmer

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The following is a Final Office action in response to applicant's amendment and response received November 10, 2009, responding to the July 10, 2009 office action provided in rejection of claims 1-19.
2. Claims 1-19 have been amended. Claims 1-19 are pending and are addressed in this office action.
3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR §1.136(a).
4. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

5. Applicant's arguments filed 11/10/2009, in particular pages 9-14, have been fully considered.
6. With respect to the **rejection of claims 13, 15 and 19 under 35 USC §101**, the amendments to the claims do not overcome this rejection and it is maintained. Claims 13 and 15 are directed to a "computer program embodied on a computer readable medium" for performing the steps of a method. Claim 19 is directed to "a data record embodied on a computer readable medium comprising" program code. As such, the claims are now directed to a product, the computer readable medium. However, a computer readable medium, as understood by one of ordinary skill in the art, can include non-statutory embodiments such as transitory signals or electromagnetic waves. Examiner suggests directing the claim to a tangible computer readable medium, or

Art Unit: 2192

including a specific definition of "computer readable medium" in the specification, to direct the claims to statutory subject matter.

7. With respect to the **rejection of claims 1-19 under 35 USC §103**, applicant presents arguments and has amended the claims. Applicant's arguments filed 11/10/2009 have been fully considered but they are not persuasive.
8. Applicant presents 19 arguments with regards to examiner's rejection under 35 USC §103. Arguments 1-7 are mere assertions that the Cyran and Frasier references do not disclose and are not suggestive of specific claim limitations from claims 1, 12, 14, 16, 17, 18, and 19 (page 9 line 16 through page 10 line 13). Arguments 8-16 are directed to arguments that Cyran does not show certain elements of the invention (page 9 line 17 through page 12 line 19). Arguments 17-19 are directed to arguments that Frasier does not show certain elements of the invention (page 12 line 20 through page 13 line 19).
9. Applicant's arguments page 9 line 16 through page 10 line 13 (numbered 1-7 by Examiner) fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.
10. Applicant's arguments page 9 line 17 through page 13 line 19 (numbered 8-19 by Examiner) do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections. These arguments merely contrast the "invention" and "present application" to the cited art, but are silent as to which claim(s) or particular limitation(s) Applicant intends as patentably novel over both of the claimed references. Under the principles of compact prosecution, examiner treats these arguments as pertaining to independent claims 1, 12, 14, and 16-19.
11. In response to applicant's arguments against the references individually (page 9 line 17 through page 13 line 19, numbered by Examiner 8-19), one cannot show nonobviousness by attacking

Art Unit: 2192

references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Examiner shall assume that these arguments are connected with independent claims 1, 12, 14, and 16-19, and address them individually.

12. In page 10 lines 14-20 (numbered 8 by Examiner) Applicant argues that Cyran fails to show "the actual method to generate the executable code". Examiner assumes this argument is directed to claims 1, 12, 14, and 16-19. These arguments are irrelevant because Examiner's rejection relies upon Cyran only to show part of "a method to generate executable code"; the full, "actual method" is shown by the combination of Cyran and Frasier.
13. In page 10 line 21 through page 11 line 7 (numbered 9 and 10 by Examiner) Applicant argues that Cyran fails to show a compressed intermediate representation. Examiner assumes this argument is directed to claims 1, 12, 14, and 16-19. Cyran shows a compressed intermediate representation because it shows encoding and optimizing code from source code to intermediate code. Encoding and optimizing code changes a code file into a file "which is smaller in size", as agreed by applicant on page 10 lines 26-29. Therefore, Cyran shows compressing the code. Therefore, Cyran does show a compressed intermediate representation.
14. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "binary format," page 10 line 29) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Examiner notes that the feature of a "binary format" is a feature of all files stored and manipulated on a digital (binary) computer.
15. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "does not preserve the syntax", page 11 line 1) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. Examiner notes that the feature of "does not preserve the syntax" is similar to the feature of

encoding a compressed intermediate representation using "statistical information" (claims 1, 12, 14, and 16-19). Examiner uses Frasier to show this limitation. Therefore, arguments that it is not shown by Cyran are irrelevant.

16. In page 11 line 8 through page 12 line 19 (numbered 11-16 by Examiner), Applicant argues that Cyran fails to show a "compressed intermediate representation" (as in claims 1, 12, 14, and 16-19) because Cyran lacks compression of any kind. As shown above and agreed by applicant, Cyran does show a form of compression. Furthermore, Examiner relies on Frasier to show the limitation of encoding a compressed intermediate representation using "statistical information." Furthermore, Examiner relies on Frasier to show the limitation of "decoding the compressed intermediate representation", where the compressed intermediate representation includes code transformed with "statistical information." Therefore, arguments that these two limitations are not shown by Cyran are irrelevant.
17. In page 12 line 20 through page 13 line 2 (numbered 17 by Examiner), Applicant argues that Frasier fails to show "the use of compiler information" (page 12 line 29). There is no such limitation explicitly recited in the claims. Examiner assumes that Applicant intends to argue that Frasier fails to teach "compiler information" in the transforming, extracting, encoding, and decoding steps (as in claims 1, 12, 14, and 16-19). However, examiner relies on Cyran to show "compiler information" in the transforming and decoding steps (see Cyran page 3 lines 12-13 "optimization information"). Examiner does rely upon Frasier to show "compiler information" in the extracting step. As noted by applicant on page 13 lines 1-2, Frasier shows "compiler information" such as "computed predictors" and "reduced predictors". Frasier further shows details of these predictors on page 243 in the cited section entitled "IR Predictors", to include specific compiler information such as "stack height" and "data type", which are compiler information alone and do not pertain to the compiled code. Therefore, Examiner respectfully disagrees that the combination of Cyran and Frasier fails to teach "compiler information" in the transforming, extracting, encoding, and decoding steps (as in claims 1, 12, 14, and 16-19).

Art Unit: 2192

18. In page 13 line 3 through page 13 line 19 (numbered 18-19 by Examiner), applicant agrees with Examiner that Frasier shows certain features of the claimed invention. Examiner notes Applicant's agreement.
19. No further argument was made with regard to the **rejection of independent claims 1, 12, 14, and 16-19 under 35 USC §103.**
20. Examiner can identify no specific argument made with regard to the **rejection of dependent claims 2-11, 13, and 15 under 35 USC §103.**
21. Examiner notes that applicant has provided no further argument with respect to the art applied to the claims.

Response to Amendment

22. With regards to the rejections set forth in the previous office action, Applicant's amendments to the claims fail to overcome the 35 USC 101 rejections of claims 13, 15, and 19. Applicant's amendments to the claims and arguments fail to overcome the previous rejections of claims 1-19 under 35 USC 103. The previously presented rejections are maintained.

Status of Claims

23. This action is in reply to the application filed on 1/19/2005 and 9/20/2005. Claims 1-20 are currently pending and have been examined. Application claims priority to provisional application (number 60-403,210) filed on 8/12/2002. Application is a national stage entry of PCT application 03/06764 with international filing date 6/27/2003 and international priority date 8/2/2002.

Drawings

24. Original drawings 1-7 were received on 1/19/2005. Drawings 1-7 are accepted.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 2192

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

25. Claims 13, 15, and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 13, 15, and 19 recite "a computer readable medium". No such structure is explicitly described in the specification, nor is the applicant's intended definition of this term clear.

Claim Rejections - 35 USC § 101

26. 35 U.S.C. §101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

27. Claims 13, 15, and 19 are rejected under 35 U.S.C. §101 because they are not directed to statutory subject matter.

1. Claims 13 and 15 are drawn to a computer program embodied on a computer readable medium.

As such, the claims are now directed to a product, the computer readable medium. A tangible computer readable medium is considered statutory under 35 USC 101. However, a computer readable medium, as understood by one of ordinary skill in the art, can include non-statutory embodiments such as transitory signals or electromagnetic waves. Computer program instructions embodied in an electromagnetic wave do not have any tangible physical structure. Therefore, these claims encompass non-statutory subject matter. See, e.g., In re Nuijten, Docket no. 2006-1371 (Fed. Cir. Sept. 20, 2007) (slip. op. at 18) ("A transitory, propagating signal like Nuijten's is not a process, machine, manufacture, or composition of matter." ... Thus, such a signal cannot be patentable subject matter.").

Art Unit: 2192

2. Examiner suggests directing the claim to a tangible computer readable medium, or including a specific definition of "computer readable medium" in the specification, to direct the claims to statutory subject matter.
3. Claim 19 is directed to a data record embodied on a computer readable medium comprising a compressed intermediate representation of an input code. Further limitations of the claim clarify that the "data record" is intended to be code capable of use with a computer processor. As such, the claims are now directed to a product, the computer readable medium. A tangible computer readable medium is considered statutory under 35 USC 101. However, a computer readable medium, as understood by one of ordinary skill in the art, can include non-statutory embodiments such as transitory signals or electromagnetic waves. Computer program instructions embodied in an electromagnetic wave do not have any tangible physical structure. Therefore, these claims encompass non-statutory subject matter. See, e.g., *In re Nuijten*, Docket no. 2006-1371 (Fed. Cir. Sept. 20, 2007) (slip. op. at 18) ("A transitory, propagating signal like Nuijten's is not a process, machine, manufacture, or composition of matter.' ... Thus, such a signal cannot be patentable subject matter.").
4. Examiner suggests directing the claim to a tangible computer readable medium, or including a specific definition of "computer readable medium" in the specification, to direct the claims to statutory subject matter.

Claim Rejections - 35 USC § 103

28. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

29. Claims 1-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cyran et al. (EP 0943990 A), hereafter Cyran, in view of "Automatic Inference of Models for Statistical Code Compression" (Fraser, 1999).

Claim 1

Cyran teaches *a method of generating executable program code for a data processing system* (see figure 1).

Cyran further teaches *an encoding stage* (performed by the "code preparation system 12", see figure 1 and page 2 line 33). Cyran further teaches *generating, by an encoding stage, a compressed intermediate representation* (see figure 1, "extended class file 14") *of an input code* (see figure 1, "input code 11").

Cyran further teaches that *the encoding stage performs the step of transforming the input code and performing a selected set of code optimization steps* (see at least page 3, lines 7-10: "the present invention is a code preparation system 12 which accepts as input pre-processed code 11, analyzes the results, and then provides a code interpretive runtime environment ... with optimization information, hints and/or directions (collectively referred to as 'optimization information') to use in further processing of the intermediate code") *resulting in transformed code* (intermediate code) *and compiler information about the transformed code* (see for example page 3, lines 12-13: "optimization information" in the form of "additional attributes added to class files 14")

Cyran also teaches *generating, by a decoding stage, the executable program code from the compressed intermediate representation* (see at least figure 1, "code interpretive runtime environment" and page 2 lines 38-39: "The code interpretive runtime environment is operable to use the instructions to further process the intermediate code on the first data processing platform").

Cyran further teaches that *the decoding stage further performs the step of further compiling the transformed code using the decoded compiler information and resulting in the executable*

program code (see at least page 3, lines 15-17: by further processing in accordance with the optimization information provided by the code preparation system 12, the code interpretive runtime environment is able to execute the intermediate code mode efficiently...")

Cyran does not explicitly teach that the *encoding stage* comprises a *statistical model* that is used to *perform the step of extracting state information of a statistical model and statistical information from the transformed code and the compiler information*. Cyran does not explicitly teach that the *encoding stage* comprises a *statistical model* that is used to *perform the step of encoding the transformed code and the compiler information to form the compressed intermediate representation*. Likewise, although Cyran teaches decoding an intermediate representation, Cyran does not explicitly teach that the *decoding stage* comprises *decoding the compressed intermediate representation* (that is, the intermediate representation encoded with the statistical information).

However, Fraser teaches a method of compressing computer programs, and in particular of intermediate representations. Frasier teaches that *state information* (e.g. the last few tokens seen, stack height, datatype of the top few stack elements, see page 243 section "IR predictors") and *statistical information* (a decision tree is generated and a probability distributed to each leaf, see page 243 section "Background: Machine learning of decision trees") is *extracted from the transformed code and the compiler information*.

Fraser further teaches that *the extracted state information and statistical information* are used to *encode the transformed code and compiler information, resulting in a compressed intermediate representation* (see at least page 242, "Motivation": "This papers principal focus is ... the more basic problem of statistical models that reduce entropy, because such models lead directly to a variety of compact encodings").

Fraser further teaches that the compressed intermediate representation is *decoded resulting in the transformed code and the compiler information* (see at least page 242, "Motivation": "saving even a few percent in size frees up more than enough resources to implement the decompressor").

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation in a limited resource computing environment of Cyran with the statistical code compression of Frasier because it would reduce the size of the representation (see at least Frasier, page 242, "Motivation").

Claim 2

Claim 2 includes all of the limitations of claim 1. Cyran teaches *the encoding stage is performed on a first data processing system* (see at least page 3, lines 13-15: "a resource rich computing environment"), and *the decoding stage is performed on a second data processing system* (see at least page 3, lines 15-17: "a limited resource computing environment"). Cyran further teaches *transferring the compressed intermediate representation from the first data processing system to the second data processing system* (see at least Figure 1 and page 3, lines 7-10: "provides a code interpretive runtime environment ... with optimization information, hints, and/or directions ... to use in further processing of the intermediate code").

Claim 3

Claim 3 includes all of the limitations of claim 1. Cyran does not teach generating state information and statistical information. Frasier teaches *generating the state information and statistical information further comprises the step of obtaining state information* (the computed predictors mentioned on page 243, section "IR Predictors") *from a state machine* (see at least page 243, section "IR Predictors": "Markov model") *based on the transformed code and the compiler information* (see at least page 243, section "IR Predictors": "IR code is full of material that can help predict what's coming next"). The predictors being tracked with every new token read, as with a Markov model, implies that a state machine is present. Frasier further teaches *generating the state information and statistical information further comprises the step of obtaining probability information* (see at least page 243) *from a statistical model* ("decision tree") *based on the obtained state information* ("predictors", see at least page 243, section "IR Predictors":

predictors are proposed, and a machine-learning algorithm is used "to identify the predictors and contexts that prove useful").

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 4

Claim 4 includes all of the limitations of claim 3. Cyran does not teach a state machine. Frasier teaches *the state machine comprises a syntactic model of at least one of the transformed code and the compiler information* (see at least page 243 section "IR Predictors": "Markov" predictors capture idioms such as the compare-branch and add-1 patterns above.") The "idioms" described by Frasier are a syntactic model because they are a function of the preceding symbols from the compiled data stream. It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 5

Claim 5 includes all of the limitations of claim 3. Cyran does not teach a state machine. Frasier teaches *the state machine comprises an execution model of the transformed code* (see at least page 243 section "IR Predictors": "stack-height ... Computed predictors encode domain-specific knowledge that is not explicitly available to general-purpose compressors"). Domain-specific knowledge such as stack-height is an execution model because it models the behavior of the code during execution.

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce

Art Unit: 2192

the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 6

Claim 6 includes all of the limitations of claim 3. Cyran does not teach a state machine. Frasier teaches *the state machine comprises a model of the compiler information* (see at least page 243 section "IR Predictors": "Computed predictors such as the stack height ... and datatype"). The computed predictors are compiler information because they contain information that has no direct impact on the correctness of reconstructed executable code (see specification page 3 line 30 though page 4 line 14, particularly "high-level language data types").

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 7

Claim 7 includes all of the limitations of claim 1. Cyran teaches *storing the intermediate representation* of the code (see at least page 6, lines 10-14: "The generation of the optimization information ... is performed ahead-of-time. The code preparation system operates ... irrespective of time ...). Cyran further teaches *performing the decoding stage in connection with a subsequent execution of the generated executable program code* (see at least page 6, lines 8-10: "optimization information ... is provided to the JIT compiler ... which ... is operable to generate native code in accordance with this optimization information").

Cyran does not explicitly teach that the compressed intermediate representation including statistical information is stored. Frasier teaches transmitting compressed intermediate representations and loading them from disk (see at least page 242, "Motivation").

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 8

Claim 8 includes all of the limitations of claim 1. Cyran teaches *the step of further compiling the transformed code further comprises further optimising the resulting executable code* (see at least page 3, lines 15-18, particularly: "the code interpretive runtime environment is able to execute the intermediate code more efficiently").

Claim 9

Claim 9 includes all of the limitations of claim 1. Cyran teaches *the input code comprises Java bytecode* (see at least page 3, lines 19-22: "the input code is Java source code or bytecodes").

Claim 10

Claim 10 includes all of the limitations of claim 1. Cyran teaches *the data processing system is a mobile terminal* (see at least page 3, lines 15-18 "digital personal assistant"). A digital personal assistant would be understood by one of ordinary skill in the art to be a mobile device or terminal.

Claim 11

Claim 11 includes all of the limitations of claim 1. Cyran teaches *the transformed code comprises a number of code elements* (see at least page 3, lines 19-23, "Java bytecodes"). Cyran does not teach a probability distribution of said code elements. Frazier teaches *determining a probability distribution of said code elements* (see page 243, "Background:

Machine learning of decision trees", particularly "a probability distribution that suits the context defined by those tests"). Frasier further teaches *providing the determined probability distribution to the step of generating statistical information* (see at least page 243, "Background: Machine learning of decision trees", particularly the example starting in the first paragraph of column 2).

It would have been obvious to one of ordinary skill in the art to combine the intermediate representation of Cyran with the statistical code compression of Fraser because it would reduce the size of the representation on a handheld computer (see at least Frasier, page 242, "Motivation").

Claim 12

Claim 12 is distinguished from claim 1 because claim 12 does not require the program code to be executable. The other features of claim 12 correspond to the features of claim 1. Claim 12 is rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 1.

Claim 13

Claim 13 is distinguished from claim 12 because it includes "a computer program code embodied on a computer readable medium operable to be loaded from the computer readable medium into a computer processor". Cyran teaches that the method is implemented on a computer (see at least figure 2, "central processing unit"). Claim 13 is rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claims 1 and 12.

Claim 14

The features of claim 14 correspond to the features of claim 1, except that claim 14 is directed only to performing the decoding stage steps on the limited-memory device. Cyran teaches performing the decoding stage steps on the limited-memory device (see at least page 3,

lines 15-18 "digital personal assistant"). The remaining limitations of claim 14 are rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 1.

Claim 15

Claim 15 is distinguished from claim 14 because it includes "a computer program code embodied on a computer readable medium operable to be loaded from the computer readable medium into a computer processor". Cyran teaches that the method is implemented on a computer (see at least figure 2, "central processing unit").

Claim 16

Claim 16 is directed to a system which performs the method described in claim 1. The system of claim 16 includes a first compiler in the encoding module and a second compiler in the decoding module. Cyran teaches a first compiler in the encoding module (see at least figure 1, part 12 "code preparation system") and a second compiler in the decoding module (see at least figure 1, "interpretive runtime environment"). The remaining limitations of claim 16 are rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 1.

Claim 17

Claim 17 is directed to an encoding device which has the same features of the system of claim 16. The features of the encoding device of claim 17 are thus rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 17.

Claim 18

Claim 18 is directed to a system which performs the method described in claim 14. Claim 18 is thus rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 14.

Art Unit: 2192

Claim 19

Claim 19 is directed to "a data record embodied on a computer readable medium" comprising a compressed intermediate representation as created in the method of claim 1. Cyran teaches that the method is implemented on a computer (see at least figure 2, "central processing unit"). Claim 19 is thus rejected as obvious over a combination of Cyran and Frazier by the same reasoning as presented for claim 1.

Cited Prior Art

30. Fraser (US 6,516,305 B1), Henkel et al. (US 6,691,305 B1), and Henkel et al. (US 6,732,256 B2) were cited in the office action of 7/10/2009 as being of relevance to the claims and to the disclosed subject matter as a whole.
31. **Examiner's Note:** The Examiner has pointed out particular references contained in the prior art of record within the body of this action for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply. Applicant, in preparing the response, should consider fully the entire reference as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Conclusion

32. Any inquiry of a general nature or relating to the status of this application or concerning this communication or earlier communications from the Examiner should be directed to **Erika Kretzmer** whose telephone number is **(571) 270-5554**. The Examiner can normally be reached Monday through Thursday, 9:30am-6:00pm Eastern Time. If attempts to reach the examiner are unsuccessful, the Examiner's supervisor, **Tuan Dam** can be reached at **(571) 272-3695**.

Art Unit: 2192

33. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://portal.uspto.gov/external/portal/pair> . Please direct questions on access to the Private PAIR system to the Electronic Business Center (EBC) at **866.217.9197** (toll-free).
34. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to 571-273-8300. Hand delivered responses should be brought to the United States Patent and Trademark Office Customer Service Window:

Randolph Building
401 Dulany Street
Alexandria, VA 22314.

/Erika Kretzmer/
Examiner, Art Unit 2192
January 30, 2010

/Tuan Q. Dam/
Supervisory Patent Examiner, Art Unit 2192